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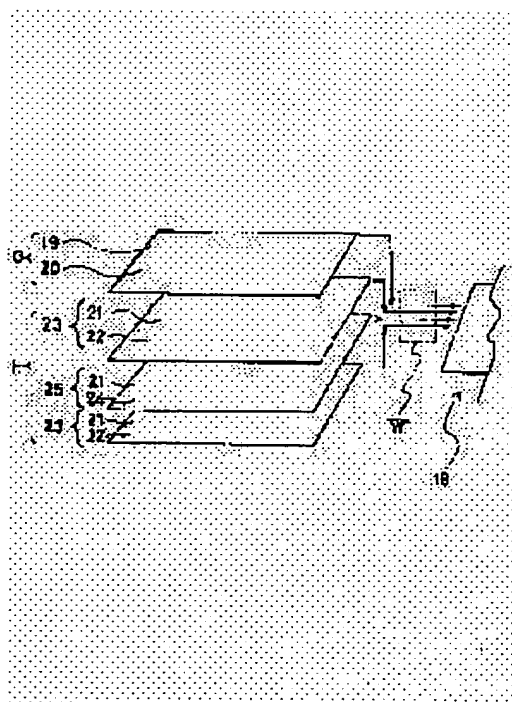
## (54) DECORATIVE PANEL

(57)Abstract:

PURPOSE: To provide a lightweight decorative panel having good appearance, hard to release and enhanced in abrasion resistance, light fastness and fire resistance by using pigment-containing fluoroplastic in decorative paper and using a prepreg wherein two kinds of specific resins are combined with a high- density woven base material as a core material and laminating the decorative paper and the prepreg to subject them to pressure molding.

CONSTITUTION: Surface decorative paper G has a film shape with a thickness of 50 $\mu$ m and is composed of colored fluoroplastic kneaded and mixed with pigment 19. A core material H consists of three layers and is formed by successively laminating a prepreg 23 wherein

an acrylic resin 22 is combined with a high-density woven fabric 21, a prepreg 25 wherein a



phenolic resin 24 is combined with the fabric 21 and a prepreg 23 wherein an acrylic resin is combined with the fabric 21. This decorative panel 118 is formed by integrally molding and curing the decorative paper G and the prepregs thus laminated in a molding process W by a co-cure molding method.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a panel. That is, in the case of the aircraft, a galley, and a coat closet, it is related with the panel used as the panel facing and panel sheathing material as interior material of the aircraft and others etc.

[0002]

[Description of the Prior Art] Generally as this kind of a panel, the web material made from plastics and the web material made from fiber strengthening plastics (product made from FRP) are used. However, the web material is weak, and the panel of the former, i.e., the web material made from plastics, had a difficulty in the side on the strength, required the handling in which it was easy to generate a blemish, a tear, etc. and they became skillful on the occasion of attachment to base materials, such as a panel, and had the difficulty that abrasion resistance, endurance, etc. are inferior on the occasion of use. On the other hand, the difficulty was pointed out to the thick side -- although the panel of the latter, i.e., the web material made from FRP, is excellent in the above-mentioned side on the strength, its price is also heavily high thickly -- the weight side, and the cost side. by the way, when to excel especially in refractoriness is demanded in many cases, for example, it is used as interior material of the aircraft, that calorific value and fuming are low as for this kind of panel etc. Since it is required that the severe predetermined fireproof criteria should be met, as a panel of the web material made from FRP, it replaces with a weave base material at that into which epoxy system resin was infiltrated, and development use of what infiltrated phenol system resin into the weave base material is being carried out recently.

[0003] Drawing 4 is the shaping explanatory view of the conventional example of the panel which consists of such a web material made from FRP. The laminating of a core material B and the protection material C is carried out to the surface tissue A, and while mutual pastes up in KO cure compression moulding technique, it comes to harden this conventional panel 1. First, Tissue A consists of 4 layer structures, and it comes to carry out the laminating of the white 1 fluororesin 5 fluoride to order by 4 or 38 microns of pigments of the shape of the transparent 1 fluororesin 2 fluoride of the shape of a 25-micron film, the acrylic adhesives 3, and a sheet, and the shape of a 50-micron film. next, the core material B -- Chu-tzu -- the textile of textile -- it consists of two-layer structure which put two sheet-like prepreps 8 into which phenol system resin 7 was infiltrated on the base material 6, and the white 1 fluororesin 9 fluoride is further used by the shape of a 25-micron film as protection material C. And further, after passing through the gravure processing process S of applying to fluororesin 5 the coating process R which applies the acrylic adhesives 3 of such a tissue A to fluororesin 2, and a pigment 4, the lamination process T which makes these Tissue A after an appropriate time, and carries out laminating processing, conventionally, the panel 1 was fabricated in one by enforcing KO cure compression moulding technique at the fabrication process U.

[0004] By the way, drawing 5 is the shaping explanatory view of a panel developed by the artificer of this invention recently. The conventional example slack panel 10 developed recently [ this ] It comes to carry out the laminating of a core material E and the protection material F to Tissue D. First as a surface

tissue D By pigment 11 entering, to the 2 film-like fluororesin 12 fluoride and a degree as a sheet-like core material E the textile of a high-density plain weave -- the thing which carried out the coat of the acrylic adhesives 16 to the one side to the prepreg 15 which combined phenol system resin 14 with the base material 13, and prepreg 15 simple substance -- and By coming to carry out the laminating of the white 1 fluororesin 17 fluoride to order by the shape of a film as protection material F, and enforcing KO cure compression moulding technique at the fabrication process V, while mutual pastes up, it hardens.

[0005]

[Problem(s) to be Solved by the Invention] By the way, if it was in the conventional panel 1 first shown in drawing 4, the 1st, 2nd, 3rd, 4th, and 5th following problem was pointed out. There was still a problem in the 1st first in a thick side and weight side and a cost side. That is, since the core material B consisted of two-layer structure of the predetermined prepreg 8 while that tissue A consisted of 4 layer structures of predetermined fluororesin 2, the acrylic adhesives 3, a pigment 4, and fluororesin 5, 1m, about 900g and thickness are [ the weight per two ] thick, thickness of weight was heavy at 0.5mm, and the conventional panel 1 of this drawing 4 had a problem as interior material of the aircraft whose lightweight-ization etc. is an important problem etc. Moreover, the coating process R, the gravure processing process S, the lamination process T, the fabrication process U, etc. were followed further, and the conventional panel 1 of this drawing 4 was fabricated, and since there were many routing counters, it also had the problem that a price was high, while it consisted of such multilayer structure.

[0006] It was easy to generate adhesion, mixing, etc. of an irregular color, a color omission, a wrinkling, irregularity, and a foreign matter, and the problem was [ 2nd ] in the appearance side. That is, it consisted of multilayer structure like \*\*\*\*, since there are many routing counters at the time of shaping and there was much migration while the conventional panel 1 of this drawing 4 had many classes of resin used, at the time of shaping, it was easy to generate static electricity and it had, it originated in such static electricity, adhesion, mixing, etc. of an irregular color, a color omission, a wrinkling, irregularity, and a foreign matter occurred plentifully, the problem was in the appearance side, and the percent defective was high [ the panel ]. Since it was used for the part where people's eyes are touched especially with this panel 1 as interior material of the aircraft etc. as the panel facing and the panel sheathing materials of a product, such as a cart of the aircraft, a galley, and a coat closet, and a fine sight is thought as important, the such poor appearance also spoiled the product appearance and it had become a problem.

[0007] It was easy to come to a front face out of the shank of the weave base material 6, and the problem was in the 3rd also from this point in the appearance side. That is, it was easy to come to a front face out of the shank of the warp of the weave base material 6 of the prepreg 8 in a core material B, and the weft, i.e., raw natural complexion, through soft about 25 microns and the soft thin fluororesin 2 grade of Tissue A at the time of operation of the KO cure compression moulding technique of the fabrication process U. And such a poor appearance of the conventional panel 1 spoiled the product appearance according to the above-mentioned, and it had become a problem.

[0008] Curl occurred, it was easy 4th to separate, and there was a problem also in a quality side. namely, Chu-tzu used for the prepreg 8 of a core material B -- the textile of textile -- the base material 6 has directivity and a flat thing obtains it -- having -- hard -- moreover -- this textile -- since rigidity is high, in the conventional panel 1 of drawing 4 which used such prepreg 8 of two sheets for the core material B, firm curl tends to generate the prepreg 8 which infiltrated phenol system resin 7 into the base material 6. Then, as interior material of the aircraft and others etc., it was in the flat base material plentifully to begin to separate from the periphery section of opposite *Perilla frutescens* (L.) Britton var. *crispa* (Thunb.) Decne., and the panel 1 which curl generated in this way had a problem in the quality side, when sticking as the panel facing and the panel sheathing material of a product. Moreover, in order to prevent such peeling, on the occasion of attachment, the handling which became skillful while use management of adhesives was complicated was required, and there was a difficulty that a man day starts very much.

[0009] There was also a problem that 5th it was inferior to sides on the strength and color fastness to

light, such as abrasion resistance. That is, although the tissue A of that front face consisted of 4 layer structures of transparent fluororesin 2, the acrylic adhesives 3, a pigment 4, and fluororesin 5, while, as for the conventional panel 1 of this drawing 4, producing the problem in the side on the strength that it will be easy to wear out with such a configuration if it is used for a long time, anxiety was pointed out to color fastness to light that it is easy to discolor.

[0010] Now, about the panel 10 of drawing 5, it is as follows. That is, that the conventional example slack panel 10 developed recently shown in this drawing 5 should solve the trouble of the conventional panel 1 grade of drawing 4, it is made and each 1st, 2nd, 3rd, 4th, and 5th trouble mentioned above is solved once. That is, since there are few laminated structures, 1m, about 500g and thickness are [ the weight per two ] thin, and thickness of weight is light [ this panel 10 is set to the 1st and the coat of the acrylic adhesives 16 is carried out to the prepreg 15 of a core material E, and ] at 0.35mm. Furthermore, the routing counter is reduced, and shaping is easy and is obtained cheaply. Since there are little routing counter at the time of shaping and migration while there are [ 2nd ] few number of laminated structures and classes of resin, static electricity hardly occurs, but it has and a poor appearance, such as adhesion, mixing, etc. of the irregular color resulting from static electricity, a color omission, a wrinkling, irregularity, and a foreign matter, is prevented. The weave base material 13 of a core material E is set to the 3rd from a high-density plain weave, and, in addition to the thing out of which a shank cannot come easily, the surface tissue D consists of fluororesin 12 in which the pigment 11 was mixed, it excels in rigidity and a side on the strength, and since it is thick, the poor appearance out of which the shank of the weave base material 13 of a core material E comes to a front face is prevented by these. Since directivity is a flat comparatively few, when the weave base material 13 of a core material E consists of a high-density plain weave, and it is hard to generate curl in the 4th and sticks on it as interior material etc., it does not begin to separate from the periphery section. As for the surface tissue D, fluororesin 12 is reinforced [ 5th ] with the pigment 11, and it excels in abrasion resistance, color fastness to light, etc.

[0011] However, even if still more nearly overall rigidity and reinforcement might fall victim a little about the panel 10 developed recently shown in this drawing 5, there was also a request that you want to put into practice the 1st and 2nd above-mentioned point further. namely, the thing which this panel 10 excelled [ mm / 0.35 ] in thickness more 1m in the weight side and the cost side the 1st although the weight per two was about 500g -- \*\* -- there was also a request. Since it became cost quantity especially since what carried out the coat of the acrylic adhesives 16 to prepreg 15 in the core material E of this panel 10 was used, and the fluororesin 17 of the shape of an about 25-micron film was used as protection material F in this panel 10, it was thin, and time was taken in the process which workability sets bad and carries out a laminating, and there was indication of becoming cost quantity also from this field. When such [ again ] protection material F set and carried out a laminating and enforced KO cure compression moulding technique to the 2nd, it was easy to generate static electricity in it, and it might have it in it, and it might originate in such static electricity, and a poor appearance, such as adhesion, mixing, etc. of an irregular color, a color omission, a wrinkling, irregularity, and a foreign matter, might occur.

[0012] Furthermore, if it was in the panel 10 of this drawing 5 other than such 1st and 2nd point, the adhesive property of a core material E was inferior, and there was indication that it is easy to separate. That is, although it has pasted up powerfully between Tissue D and the core material E in this panel 10 with the acrylic adhesives 16 by which the coat was carried out to the prepreg 15 of a core material E, it has pasted up with the phenol system resin 14 of both the prepreps 15 between the core materials E of two sheets. However, the adhesive strength of these phenol system resin 14 was weak, it had it, the adhesive property between core materials E was inferior in it, and the problem was in that adhesion a little.

[0013] While this invention is made in view of such the actual condition and using the fluororesin containing a pigment as a tissue By having used each prepreg which combined acrylic resin, phenol system resin, and acrylic resin with the high-density weave base material in order as a core material To the 1st, it is lightly cheap very thinly, and begins 2nd to prevent the poor appearance by static electricity certainly. While the poor appearance out of which the shank of a weave base material comes to a front

face the 3rd is prevented, there is [ 4th ] also no peeling by curl, and abrasion resistance and color fastness to light improve [ 5th ] and coming [ 6th ] to excel in refractoriness extremely, it aims at proposing the panel which does not have [ 7th ] a problem in the adhesion of a core material, either. [0014]

[Means for Solving the Problem] The technical means of this invention which attains this purpose are as follows. namely, this panel -- as a surface tissue -- film-like the fluoro-resin containing a pigment, and a degree -- textile high-density as a sheet-like core material -- the prepreg which combined acrylic resin with the base material, and high-density textile -- the prepreg which combined phenol system resin with the base material, and high-density textile -- while it comes to carry out the laminating of the prepreg which combined acrylic resin with the base material to order and mutual pastes up in KO cure compression moulding technique, it hardens.

[0015]

[Function] Since this invention consists of such a means, it acts as follows. Each prepreg which the fluoro-resin in which the pigment was mixed as a surface tissue was used, and combined acrylic resin, phenol system resin, and acrylic resin in order to the high-density weave base material as a core material is used, and it comes to fabricate this panel in KO cure compression moulding technique in one. Then, since there are very few laminated structures not using the protection material of fluoro-resin while using the prepreg of acrylic resin for the 1st into a core material, thickness is very thin especially and this panel has light weight. Furthermore, it is reduced sharply, and shaping is simply easy and a routing counter is obtained cheaply. A poor appearance, such as adhesion, mixing, etc. of the irregular color to which static electricity does not occur, has in it, and it originates in static electricity since it has less routing counter at the time of shaping and migration and especially protection material is not used for it while the 2nd has few number of laminated structures and classes of resin in this way, a color omission, a wrinkling, irregularity, and a foreign matter, is prevented certainly. The poor appearance out of which the shank of the weave base material of a core material comes to a front face by these since it excels [ consist of fluoro-resin in which, as for the surface tissue, the pigment was mixed in addition to what consists of what has the high-density weave base material of the 3rd core material in these, and a shank cannot come out of easily, and ] in a side rigidity and on the strength and is thick is prevented certainly. Since directivity is a flat comparatively few, when the weave base material of a core material consists of a high-density thing, and it is hard to generate curl and sticks [ 4th ] as interior material etc., it does not begin to separate from the periphery section. As for the surface tissue, fluoro-resin is reinforced [ 5th ] with the pigment, and it excels in abrasion resistance, color fastness to light, etc. Calorific value, fuming, etc. are extremely excellent in refractoriness low by having used phenol system resin into the core material the 6th etc. It pastes up powerfully and between a tissue and the prepreps of the phenol system resin not only between core materials but in a core material is excellent also in the adhesive property between core materials, and adhesion with the prepreg of the acrylic resin in a core material the 7th.

[0016]

[Example] Below, this invention is explained to a detail based on the example shown in a drawing. Drawing 1 is the shaping explanatory view of the example of this invention. In addition, the expansion explanatory view at the time of shaping according [ drawing 2 ] to KO cure compression moulding technique and drawing 3 are the cross-section explanatory views of a honeycomb panel. This panel 18 to the film-like fluoro-resin 20 containing pigment 19, and a degree as a surface tissue G as a sheet-like core material H To first, the prepreg 23 and the degree which combined acrylic resin 22 with the high-density weave base material 21 The laminating of the prepreg 25 which combined phenol system resin 24 with the high-density weave base material 21, and the prepreg 23 which combined acrylic resin 22 with the still higher-density weave base material 21 is carried out to order, and while mutual pastes up in KO cure compression moulding technique, it comes to harden.

[0017] If these are explained in full detail, first, nothing and a pigment 19 elaborate on the shape of a 50-micron film, and the surface tissue G will be crowded and will consist of 2 fluoro-resin 20 fluoride mixed and colored. Next, a core material H consists of a three-tiered structure, and the laminating is first

carried out to the order of the prepreg 23 which combined acrylic resin 22 next the prepreg 25 which combined phenol system resin 24, and the prepreg 23 which combined acrylic resin 22 again to the high-density weave base material 21. textile -- a base material 21 -- a glass fiber, Kevlar fiber, carbon fiber, and these yes -- Brit fiber etc. -- a plain weave and Chu-tzu -- what was equipped with warp and the weft and was woven by textile, twill, etc. at high density -- becoming -- the one direction of only warp -- a base material -- the textile of what is called YUNI, and others -- although a base material is distinguished, in the example of illustration, the thing of a high density type plain weave is used. As a weave base material 21 of such a high-density plain weave, a 60x60 about thing is used per 1 inch square, for example. And each prepreps 23, 25, and 23 come to combine acrylic resin 22 and phenol system resin 24 with such a weave base material 21 by sinking in, adhesion, a polymerization, etc., and the weave base material 21, and acrylic resin 22 and phenol system resin 24 are used at a rate of 6 to 4 by the weight ratio.

[0018] And this panel 18 is fabricated in one to that to which these were set to in order and the laminating was carried out by enforcing KO cure compression moulding technique at the fabrication process W. KO cure compression moulding technique remains as it is, without once stiffening the prepreps 23, 25, and 23 of a core material H unlike the so-called hardening method, it consists of a method which pastes up Tissue G, a core material H, etc. with pressurization heating, and thereby, while mutual pastes up, each hardens, prepreps 23, 25, and 23 FRP-ize, and the predetermined panel 18 is obtained. In addition, drawing 2 shows one example of the KO cure compression moulding technique of such a fabrication process W, and a crepe pattern is formed in the tissue G of the front face of a panel 18 through the separator paper 28 of the irregularity of the version 27 of metal mold 26 front face. Now, although this panel 18 is used as interior material of the aircraft and others etc. as the panel facing and the panel sheathing material of the cart of the aircraft, a galley, and a coat closet, drawing 3 shows one example of such a honeycomb panel P. That is, although, as for the honeycomb panel P, the panel facing X and Y is stuck on both sides of a honeycomb core Q, and it becomes, as shown in drawing 3, and the panel sheathing material Z may be suitably stuck like further illustration on the panel facing X by the side of one front face, when, as for a panel 18, the panel sheathing material Z is used on the panel facing X, for example as panel facing X of one of these, it is used as a panel sheathing material Z.

[0019] The panel 18 of this invention is as mentioned above. Then, it is as follows. First, as a surface tissue G, the nothing pigment 19 elaborates on the shape of a film, it is crowded with these panels 18, and each prepreps 23, 25, and 23 which the fluoro-resin 20 mixed and colored was used and combined acrylic resin 22, phenol system resin 24, and acrylic resin 22 in order to the high-density weave base material 21 as a core material H are used by them. And it comes to fabricate these in one by this panel's 18 carrying out the laminating of such a tissue G and the core material H of three layers to order, and enforcing KO cure compression moulding technique at the fabrication process W. And on the drawing in a core material H, the fluoro-resin 20 of Tissue G and the prepreg 23 of this maximum upper layer pasted up with the acrylic resin 22 of the prepreg 23 of the maximum upper layer, and both this prepreg 23 and the prepreg 25 of phenol system resin 24 in the meantime have pasted up with the acrylic resin 22 of the prepreg 23 of the maximum upper layer in a core material H, and the prepreg 23 of the lowest layer. In addition, the prepreg 23 of such a lowest layer of a core material H has achieved the whole protective function instead of the conventional protection material C and F (refer to drawing 4 and drawing 5). Now, this panel 18 becomes there like the following 1st, the 2nd, the 3rd, the 4th, the 5th, the 6th, and the 7th.

[0020] Since the 1st has very still few laminated structures as four sheets not using the protection material C and F (refer to drawing 4 and drawing 5) of fluoro-resin 9 and 17, 1m, thickness is very thin especially and the weight per two has [ thickness ] weight as light- [ this panel 18 uses the prepreg 23 of acrylic resin 22 for it into a core material H while that tissue G is set to it from the fluoro-resin 20 containing pigment 19, and ] to it at 0.35mm as about 450g. That is, even if it compares with the thing of drawing 5 by this panel 18 to the weight per two having had about 500g of thickness 1m by 0.35mm also by the conventional example slack panel 10 which the weight per two has 1m of thickness also about 900g by 0.5mm by the panel 1 of the this kind [ of drawing 4 R> 4 ] conventional example, and

was developed recently [ of drawing 5 ], weight has become light about 10%. Moreover, since it is further fabricated by enforcing KO cure compression moulding technique at the fabrication process W and the routing counter at the time of shaping is sharply reduced while this panel 18 has few laminated structures in this way, shaping is obtained very simply easily and especially cheaply. Namely, the panel 1 of this seed conventional example of drawing 4 R> 4 follows the coating process R, the gravure processing process S, the lamination process T, and the fabrication process U, and is fabricated. There are very many routing counters at the time of shaping. In the panel 10 of drawing 5 R> 5 Carry out the coat of the acrylic adhesives 16 to the prepreg 15 of the core material E, or Furthermore, compared with having taken time in the process to which the example of drawing 4 and drawing 5 sets and carries out the laminating of the protection material C and F of fluororesin 9 and 17, this panel 18 is obtained only by enforcing KO cure compression moulding technique by that by which was only set and the laminating was carried out, and is cheaply fabricated.

[0021] Since the protection material C and F which the routing counter at the time of shaping is reduced while there are few classes of resin which the 2nd has few laminated structures in this way as for this panel 18, and is used, there is less migration, and static electricity tended [ especially ] to generate conventionally is not used, static electricity is not generated at the time of shaping. Therefore, generating of adhesion, mixing, etc. of the irregular color resulting from static electricity, a color omission, a wrinkling, irregularity, and a foreign matter is prevented certainly, this panel 18 is compared with the panel 1 of this seed conventional example of drawing 4 , and the panel 10 of drawing 5 , and a poor appearance decreases certainly.

[0022] The weave base material 21 of the core material H of this panel 18 is set to the 3rd from a high-density thing with these, are hard to come out of a shank, consist of fluororesin 20 with which the pigment 19 was mixed and the surface tissue G was reinforced further, excel in rigidity and a side on the strength, and since it is thick In the time of operation of the KO cure compression moulding technique of the fabrication process W etc., it is hard to come to a front face by these out of the shank, i.e., the raw natural complexion, of the warp of the weave base material 21 of a core material H, and the weft. Namely, the fluororesin 2 of Tissue A is softly as thin as about 25 microns like the panel 1 of this seed conventional example of drawing 4 . the textile of a core material B -- if it is in this panel 18 compared with having been easy to come to a front face out of the shank of a base material 6 -- the textile of a core material H -- the thing out of which a base material 21 is dense and a shank cannot come easily -- adding -- still more powerful about 50 microns and thick tissue G -- the textile of a core material H -- the poor appearance out of which the shank of a base material 21 comes to a front face is prevented certainly.

[0023] Since as for this panel 18 the weave base material 21 of a core material H consists of a high-density thing and directivity tends to serve as a flat comparatively few the 4th, also on the whole, it is hard to generate curl. That is, the panel 1 of this seed conventional example of drawing 4 stops being able to generate curl in this panel 18 easily compared with having been easy to generate the curl with it, using the predetermined prepreg 8 of two sheets as a core material B. [ high rigidity and ] [ firm ] Then, as interior material of the aircraft and others etc., this panel 18 does not begin to separate from that periphery section to (refer to drawing 3 ) and a flat base material (a honeycomb core Q or panel facing X), when stuck as the panel facing X and the panel sheathing material Z of a product.

[0024] The tissue G of the front face of this panel 18 is set to the 5th from the fluororesin 20 of the shape of a film which the pigment 19 scoured and was colored by being crowded. Then, it compares with the tissue A which arranged the sheet-like pigment 4 and was colored the bottom of the transparent fluororesin 2 of the shape of a surface film like the panel 1 of this seed conventional example of drawing 4 , and, as for the tissue G of this panel 18, fluororesin 20 is reinforced with the pigment 19. Therefore, even if this tissue G and a panel 18 carry out long duration use, while they are [ that it is hard to wear out ] excellent in abrasion resistance etc., it is [ that it is hard to discolor / whenever / discoloration ] highly excellent [ evaluation ] in color fastness to light.

[0025] By having used phenol system resin 24 for the core material H etc., in case of the fire, as for this panel 18, calorific value, fuming, etc. are low, and extremely excellent in refractoriness with these. [ 6th ] Then, this panel 18 can meet the severe predetermined fireproof criteria in a calorific value



measurement trial or a fuming trial, when used as interior material of the aircraft.

[0026] Further, by the prepreg 23 of the acrylic resin 22 in that core material H, it pastes up powerfully and this panel 18 excels [ between / Tissue G and the prepregs 25 of the phenol system resin 24 not only between core materials H but in a core material H ] also in the adhesive property between core materials H, and adhesion the 7th. That is, the situation which was weak, was inferior to the adhesive property in it like the panel 10 of the conventional example developed recently [ of drawing 5 ], and had a problem in adhesion a little is avoided certainly. [ of the adhesive strength for two sheets of a core material E ]

[0027] In addition, if it is in the panel 18 of the example of illustration, the film of a non-extended type is used as 2 containing pigment 19 fluororesin 20 fluoride of the tissue G. Then, it compares with the thing which comes to use a biaxial extension type film as 1 fluororesin fluoride of that tissue A like the panel 1 of this seed conventional example of drawing 4 , and when the tissue G of this panel 18 enforces KO cure compression moulding technique at the part and the fabrication process W which are not extended and pulled, directivity cannot come out of it easily. Therefore, Tissue G and the panel 18 of the example of illustration are compared with Tissue A and the panel 1 of the conventional example of drawing 4 also from this point, and have the advantage that generating of a wrinkling, irregularity, curl, etc. is prevented.

[0028]

[Effect of the Invention] The panel concerning this invention demonstrates the 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th following effectiveness by having used each prepreg which combined acrylic resin, phenol system resin, and acrylic resin with the high-density weave base material in order as a core material while using the fluororesin containing a pigment for a tissue, as explained above.

[0029] It excels in the 1st very much in the thick side and weight side and the cost side. That is, its weight is light especially while this panel has very thin thickness, and it is the the best for the interior material of the aircraft whose lightweight-ization etc. is an important problem, and others etc., and, moreover, shaping is obtained very simply easily and especially cheaply.

[0030] The poor appearance by static electricity is prevented [ 2nd ] certainly, and it excels especially in the appearance side. That is, since static electricity does not generate this panel at the time of shaping, a poor appearance is prevented and the percent defective of adhesion and mixing of the irregular color resulting from static electricity, a color omission, a wrinkling, irregularity, and a foreign matter is also very low. As interior material of the aircraft and others etc., as panel facing and panel sheathing materials, such as a cart, a galley, and a coat closet, since especially this panel is used for the part where people's eyes are touched and a fine sight is thought as important, it raises a product appearance by excelling especially in an appearance side in this way.

[0031] With these, the poor appearance out of which the shank of a weave base material comes to a front face is prevented certainly, and it excels [ 3rd ] especially in the appearance side also from this point. That is, since the shank of the warp of the weave base material used into a core material and the weft, i.e., raw natural complexion, does not come out to a front face but this panel is excellent in especially the appearance side, it is used for the part with which people's eyes are touched according to the place mentioned above, and raises a product appearance.

[0032] There is no peeling by curl and it excels [ 4th ] also in the quality side. That is, as interior material of the aircraft and others etc., since it is hard to generate curl, when stuck as for example, panel facing or a panel sheathing material, it is very excellent [ this panel ] in the quality side so that it may not begin to separate in a flat base material from the periphery section of opposite *Perilla frutescens* (L.) Britton var. *crispa* (Thunb.) Decne. Then, on the occasion of attachment, there is also no \*\* which requires the handling which use management of adhesives was not complicated and became skillful, and a man day is reduced.

[0033] It excels [ 5th ] also in sides on the strength and color fastness to light, such as abrasion resistance. That is, this panel is [ that it is hard to discolor ] excellent also in color fastness to light while excelling [ be / even if it carries out long duration use / out / it / hard to wear ] in a side on the strength.

[0034] It excels [ 6th ] in refractoriness extremely. That is, this panel is the the best for the interior material of the aircraft by which calorific value, fuming, etc. are extremely excellent in refractoriness

low, and high-level refractoriness is demanded, and others etc.

[0035] There is [ 7th ] no problem also in adhesion. That is, if it is in this panel, since it has pasted up powerfully, not only between a tissue and a core material but the core materials itself is excellent in the adhesive property between core materials and its adhesion of that improves, generating of peeling etc. is prevented certainly. Thus, effectiveness which this invention demonstrates is made remarkable and a so-called size has it -- the trouble which consisted in this seed conventional example is swept away.

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[Translation done.]

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**CLAIMS**

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[Claim(s)]

[Claim 1] as a surface tissue -- film-like the fluoro-resin containing a pigment, and a degree -- textile high-density as a sheet-like core material -- the prepreg which combined acrylic resin with the base material, and high-density textile -- the prepreg which combined phenol system resin with the base material, and high-density textile -- the panel which it comes to carry out the laminating of the prepreg which combined acrylic resin with the base material to order, and is characterized by hardening while mutual pastes up in KO cure compression moulding technique.

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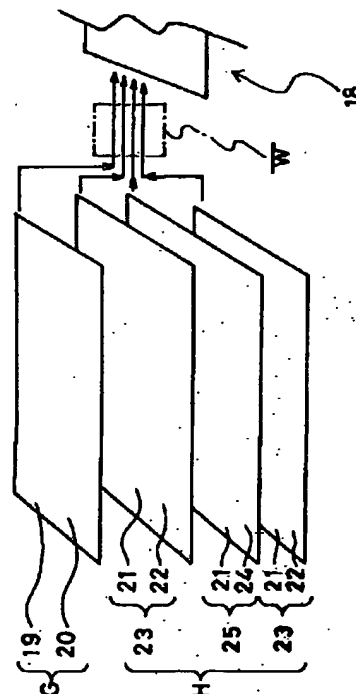
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(54)【発明の名称】 化粧板

(57)【要約】

【目的】 第1に、極めて肉厚が薄く特に重量が軽くコストも安く、第2に、色むら、色抜け、しわ、凹凸、異物の付着・混入等の外観不良が確実に防止されると共に、第3に、織り基材の柄が表面に出る外観不良も確実に防止され、第4に、カールによる剥がれがなく、第5に、耐摩耗性や耐光堅牢度に優れ、第6に、発熱量や発煙性等が低く耐火性に極めて優れてなり、第7に、芯材の密着性にも優れ剥がれも防止される、化粧板を提案する。

【構成】 この化粧板18は、表面の化粧紙Gとしてフィルム状の顔料19入りフッ素系樹脂20、次に芯材Hとして、高密度な織り基材21に対し、アクリル系樹脂22、フェノール系樹脂24、アクリル系樹脂22を順に組み合わせたアブリエグ23、25、23が順に積層され、コ・キュア加圧成形法により、相互間が接着されると共に硬化され、一体的に成形されてなる。



## 【特許請求の範囲】

【請求項1】 表面の化粧紙としてフィルム状の顔料入りフッ素系樹脂、次にシート状の芯材として、高密度な織り基材にアクリル系樹脂を組み合わせたアブリレグ、高密度な織り基材にフェノール系樹脂を組み合わせたアブリレグ、高密度な織り基材にアクリル系樹脂を組み合わせたアブリレグが、順に積層されてなり、コ・キュア加圧成形法にて相互間が接着されると共に硬化されていること、を特徴とする化粧板。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は化粧板に関する。すなわち、航空機その他の内装材等として、例えば航空機のカート、ギャレー、コートクロゼットにおいて、そのパネル表面材やパネル外装材として使用される、化粧板に関するものである。

## 【0002】

【従来の技術】この種の化粧板としては、一般にプラスチック製シート材や繊維強化プラスチック製（FRP製）シート材が用いられている。しかしながら、前者つまりプラスチック製シート材の化粧板は、腰が弱く強度面に難点があり、例えば、パネル等の母材への貼り付けに際し傷や破れ等が発生し易く熟練した取り扱いを要し、又、使用に際し耐摩耗性や耐久性等が劣るという難点があった。他方、後者つまりFRP製シート材の化粧板は、上述の強度面には優れているものの、厚く重く価格も高い等、肉厚面、重量面、コスト面に難点が指摘されていた。ところでこの種の化粧板は、発熱量や発煙性が低い等、特に耐火性に優れていることが要求されることが多く、例えば航空機の内装材として使用される場合には、所定の厳しい耐火基準を満たすことが要求されるので、FRP製シート材の化粧板としては、織り基材にエポキシ系樹脂を含浸させたものに代え、最近では、織り基材にフェノール系樹脂を含浸させたものが開発使用されつつある。

【0003】図4は、このようなFRP製シート材よりなる化粧板の従来例の成形説明図である。この従来例の化粧板1は、表面の化粧紙Aと芯材Bと保護材Cとが積層され、コ・キュア加圧成形法にて相互間が接着されると共に硬化されてなる。まず、化粧紙Aは4層構造よりなり、25ミクロンのフィルム状の透明な1フッ化フッ素系樹脂2、アクリル系接着剤3、シート状の顔料4、38ミクロン又は50ミクロンのフィルム状で白色の1フッ化フッ素系樹脂5が順に積層されてなる。次に芯材Bは、朱子織りの織り基材6にフェノール系樹脂7を含浸させたシート状のアブリレグ8を2枚重ねた2層構造よりなり、更に保護材Cとしては、25ミクロンのフィルム状で白色の1フッ化フッ素系樹脂9が用いられている。そして従来は、このような化粧紙Aのアクリル系接着剤3をフッ素系樹脂2に塗る塗工工程Rや、顔料4を

フッ素系樹脂5に塗るグラビア加工工程Sや、更にしかる後、これらを化粧紙Aとして積層加工するラミネート加工工程T等を経た後、成形加工工程Uにてコ・キュア加圧成形法を実施することにより、化粧板1が一体的に成形されていた。

【0004】ところで図5は、本発明の発明者により最近開発された化粧板の成形説明図である。この最近開発された従来例たる化粧板10は、化粧紙Dと芯材Eと保護材Fとが積層されてなり、まず、表面の化粧紙Dとしては、顔料11入りでフィルム状の2フッ化フッ素系樹脂12、次にシート状の芯材Eとして、高密度な平織りの織り基材13にフェノール系樹脂14を組み合わせたアブリレグ15に対し、その片面にアクリル系接着剤16をコートしたもの、およびアブリレグ15単体、そして、保護材Fとしてフィルム状で白色の1フッ化フッ素系樹脂17が順に積層されてなり、成形加工工程Vにてコ・キュア加圧成形法を実施することにより、相互間が接着されると共に硬化されている。

## 【0005】

【発明が解決しようとする課題】ところで、まず図4に示した従来例の化粧板1にあっては、次の第1、第2、第3、第4、第5の問題が指摘されていた。まず第1に、肉厚面、重量面、コスト面に依然として問題があった。すなわち、この図4の従来例の化粧板1は、その化粧紙Aが所定のフッ素系樹脂2、アクリル系接着剤3、顔料4、フッ素系樹脂5の4層構造よりなると共に、芯材Bも所定のアブリレグ8の2層構造よりなるので、厚みが0.5mmで1㎡当たりの重量が900g程度と、肉厚が厚く重量も重く、軽量化等が重要課題である航空機の内装材等としては問題があった。又、この図4の従来例の化粧板1は、このような多層構造よりなると共に、更に塗工工程R、グラビア加工工程S、ラミネート加工工程T、成形加工工程U等を辿って成形され、工程数が多いので、価格が高いという問題もあった。

【0006】第2に、色むら、色抜け、しわ、凹凸、異物の付着・混入等が発生しやすく、外観面に問題があった。すなわち、この図4の従来例の化粧板1は、上述のごとく多層構造よりなり、用いられる樹脂の種類が多いと共に、成形時の工程数が多く移動が多いので、成形時に静電気が発生しやすく、もって、このような静電気に起因して色むら、色抜け、しわ、凹凸、異物の付着・混入等が多々発生し、外観面に問題があり不良率が高かった。特に、この化粧板1は航空機の内装材等として、例えば航空機のカート、ギャレー、コートクロゼット等の製品のパネル表面材やパネル外装材として、人の目にふれ美観が重視される箇所に使用されるので、このような外観不良は製品外観をも損ない問題となっていた。

【0007】第3に、織り基材6の柄が表面に出やすく、この点からも外観面に問題があった。すなわち、芯材Bにおけるアブリレグ8の織り基材6の縦糸と横糸の

柄、つまり生地肌が、成形加工工程Uのコ・キュア加压成形法の実施時において、化粧紙Aの柔らかく25ミクロン程度と薄いフッ素系樹脂2等を介し、表面に出やすかった。そして、このような従来の化粧板1の外観不良も、前述に準じ製品外観を損ない問題となっていた。

【0008】第4に、カールが発生して剥がれやすく、品質面にも問題があった。すなわち、芯材Bのアリアレグ8に用いられる朱子織りの織り基材6は、方向性を有しておりフラットなものが得られ難く、しかも、この織り基材6にフェノール系樹脂7を含浸させたアリアレグ8は剛性が高いので、このような2枚のアリアレグ8を芯材Bに用いた図4の従来の化粧板1では、強固なカールが発生しやすい。そこで、このようにカールが発生した化粧板1は、航空機その他の内装材等として、例えば製品のパネル表面材やパネル外装材として貼り付ける場合に、フラットな母材に対しその外周部から剥がれ出すことが多々あり、品質面に問題があった。又、このような剥がれを防止するためには、貼り付けに際し、接着剤の使用管理が複雑化すると共に熟練した取り扱いを要し、工数が非常にかかるという難点があった。

【0009】第5に、耐摩耗性等の強度面や耐光堅牢度に劣るという問題もあった。すなわち、この図4の従来の化粧板1は、その表面の化粧紙Aが透明なフッ素系樹脂2、アクリル系接着剤3、顔料4、フッ素系樹脂5の4層構造よりなるが、このような構成では、長時間使用すると摩耗しやすく強度面に問題を生じると共に、変色しやすく耐光堅牢度に不安が指摘されていた。

【0010】さて、図5の化粧板10については、次のとおり。すなわち、この図5に示した最近開発された従来例たる化粧板10は、図4の従来の化粧板1等の問題点を解決すべくなされたものであり、上述した第1、第2、第3、第4、第5の各問題点は一応解決されている。すなわち、この化粧板10は、第1に、アクリル系接着剤16は芯材Eのアリアレグ15にコートされており、積層構造の数が少ないので、厚みが0.35mmで1㎡当たりの重量が500g程度と、肉厚が薄く重量も軽い。更に工程数が削減されており、成形が容易で安価に得られる。第2に、積層構造の数および樹脂の種類が少ないと共に、成形時の工程数および移動が少ないので、静電気が殆ど発生せず、もって、静電気に起因する色むら、色抜け、しわ、凹凸、異物の付着・混入等の外観不良が防止される。第3に、芯材Eの織り基材13が高密度な平織りよりなり、柄が出にくいのに加え、表面の化粧紙Dは顔料11が混入されたフッ素系樹脂12よりなり、剛性、強度面に優れ厚いので、これらにより、芯材Eの織り基材13の柄が表面に出る外観不良も防止される。第4に、芯材Eの織り基材13が高密度な平織りよりなり、方向性が少なく比較的フラットなので、カールが発生しにくく、内装材等として貼り付ける場合に外周部から剥がれ出すことはない。第5に、表面の化粧紙D

はフッ素系樹脂12が顔料11にて補強されており、耐摩耗性や耐光堅牢度等に優れている。

【0011】しかしながら、この図5に示した最近開発された化粧板10に関しては、更に、全体的な剛性、強度が若干犠牲になるようなことがあっても、上述の第1、第2の点をより一層徹底させたいとの要請もあった。すなわち第1に、この化粧板10は、厚みが0.35mmで1㎡当たりの重量が500g程度であるが、より重量面そしてコスト面に優れたものをとの要望もあった。特に、この化粧板10の芯材Eでは、アリアレグ15にアクリル系接着剤16をコートしたものが用いられているので、コスト高となり、又、この化粧板10では保護材Fとして、25ミクロン程度のフィルム状のフッ素系樹脂17が用いられているので、薄くて加工性が悪くセットして積層する工程に手間取り、この面からもコスト高となるという指摘があった。第2に、又このような保護材Fは、セットして積層しコ・キュア加压成形法を実施する際に静電気が発生しやすく、もって、このような静電気に起因して色むら、色抜け、しわ、凹凸、異物の付着・混入等、外観不良が発生することがあった。

【0012】更にこのような第1、第2の点のほかに、この図5の化粧板10にあっては、芯材Eの接着性が劣り、剥がれやすいとの指摘があった。すなわち、この化粧板10では化粧紙Dと芯材E間、芯材Eのアリアレグ15にコートされたアクリル系接着剤16で強力に接着されているが、2枚の芯材E間、両アリアレグ15のフェノール系樹脂14により接着されている。しかしながらこのフェノール系樹脂14どうしの接着力は弱く、もって芯材E間における接着性が劣り、その密着性に若干問題があった。

【0013】本発明は、このような実情に鑑みなされたものであって、化粧紙として顔料入りフッ素系樹脂を用いると共に、芯材として、高密度な織り基材にアクリル系樹脂、フェノール系樹脂、アクリル系樹脂を順に組み合わせた各アリアレグを用いたことにより、第1に、極めて薄く軽く安価であり、第2に、静電気による外観不良が確実に防止されるのを始め、第3に、織り基材の柄が表面に出る外観不良も防止され、第4に、カールによる剥がれもなく、第5に、耐摩耗性や耐光堅牢度が向上し、第6に、耐火性に極めて優れてなると共に、第7に、芯材の密着性にも問題がない、化粧板を提案することを目的とする。

【0014】

【課題を解決するための手段】この目的を達成する本発明の技術的手段は、次のとおりである。すなわち、この化粧板は、表面の化粧紙としてフィルム状の顔料入りフッ素系樹脂、次にシート状の芯材として、高密度な織り基材にアクリル系樹脂を組み合わせたアリアレグ、高密度な織り基材にフェノール系樹脂を組み合わせたアリアレグ、高密度な織り基材にアクリル系樹脂を組み合わせた

たアブリレグが、順に積層されてなり、コ・キュア加圧成形法にて相互間が接着されると共に硬化されている。

【0015】

【作用】本発明は、このような手段よりなるので、次のように作用する。この化粧板は、表面の化粧紙として顔料が混入されたフッ素系樹脂が用いられ、又、芯材としては、高密度な織り基材に対し、アクリル系樹脂、フェノール系樹脂、アクリル系樹脂を順に組み合わせた各アブリレグが用いられ、コ・キュア加圧成形法にて一体的に成形されてなる。そこでこの化粧板は、第1に、芯材中にアクリル系樹脂のアブリレグを用いると共にフッ素系樹脂の保護材を用いず、積層構造の数が非常に少ないので、極めて肉厚が薄く特に重量が軽い。更に工程数が大幅に削減され、成形が簡単容易で安価に得られる。第2に、このように積層構造の数および樹脂の種類が少ないと共に、成形時の工程数および移動が一段と少なく、特に保護材を用いないので、静電気が発生せず、もって静電気に起因する色むら、色抜け、しわ、凹凸、異物の付着・混入等の外観不良は確実に防止される。これらと共に第3に、芯材の織り基材が高密度なものとなり、柄が出にくいのに加え、表面の化粧紙は顔料が混入されたフッ素系樹脂よりなり、剛性、強度面に優れ厚いので、これらにより、芯材の織り基材の柄が表面に出る外観不良も確実に防止される。第4に、芯材の織り基材が高密度なものとなり、方向性が少なく比較的フラットなので、カールが発生しにくく、内装材等として貼り付ける場合に外周部から剥がれ出すことはない。第5に、表面の化粧紙はフッ素系樹脂が顔料にて補強されており、耐摩耗性や耐光堅牢度等に優れている。第6に、フェノール系樹脂を芯材中に用いたこと等により、発熱量や発煙性等が低く耐火性に極めて優れている。第7に、芯材中のアクリル系樹脂のアブリレグにより、化粧紙と芯材間のみならず芯材中のフェノール系樹脂のアブリレグとの間も、強力に接着され、芯材間の接着性そして密着性にも優れている。

【0016】

【実施例】以下本発明を、図面に示すその実施例に基づいて詳細に説明する。図1は本発明の実施例の成形説明図である。なお、図2はコ・キュア加圧成形法による成形時の拡大説明図、図3はハニカムパネルの断面説明図である。この化粧板18は、表面の化粧紙Gとしてフィルム状の顔料19入りフッ素系樹脂20、次にシート状の芯材Hとして、まず、高密度な織り基材21にアクリル系樹脂22を組み合わせたアブリレグ23、次に、高密度な織り基材21にフェノール系樹脂24を組み合わせたアブリレグ25、更に、高密度な織り基材21にアクリル系樹脂22を組み合わせたアブリレグ23が、順に積層され、コ・キュア加圧成形法にて相互間が接着されると共に硬化されてなる。

【0017】これらについて詳述すると、まず表面の化

粧紙Gは、50ミクロンのフィルム状をなし、顔料19が練り込まれ混入されて着色された2フッ化フッ素系樹脂20よりなる。次に、芯材Hは3層構造よりなり、高密度な織り基材21に対し、まず、アクリル系樹脂22を組み合わせたアブリレグ23、次に、フェノール系樹脂24を組み合わせたアブリレグ25、そして再び、アクリル系樹脂22を組み合わせたアブリレグ23の順に積層されている。織り基材21は、ガラス繊維、ケブラー繊維、カーボン繊維、これらのハイブリット繊維等が、平織り、朱子織り、綾織り等により、縦糸と横糸を備えて高密度に織られたものよりなり、縦糸のみの一方向基材たるユニと称されるもの、その他の織り基材とは区別されるが、図示例では高密度タイプの平織りのものが用いられている。このような高密度な平織りの織り基材21としては、例えば、1インチ平方当たり60本×60本程度のものが使用される。そして各アブリレグ23、25、23は、このような織り基材21にアクリル系樹脂22やフェノール系樹脂24を、含浸、付着、重合等により組み合わせてなり、織り基材21とアクリル系樹脂22やフェノール系樹脂24とは、重量比で6対4の割合で用いられている。

【0018】そしてこの化粧板18は、これらが順にセットされて積層されたものに対し、成形加工工程Wにてコ・キュア加圧成形法を実施することにより、一体的に成形される。コ・キュア加圧成形法は、いわゆる硬化法とは異なり、芯材Hのアブリレグ23、25、23を一旦硬化させることなくそのまま、加圧加熱により化粧紙G、芯材H等を接着する方式よりなり、これにより、相互間が接着されると共に各々が硬化して、アブリレグ23、25、23がFRP化し、所定の化粧板18が得られる。なお図2は、このような成形加工工程Wのコ・キュア加圧成形法の1例を示し、金型26表面の版27の凹凸により、セパレーター紙28を介し化粧板18の表面の化粧紙Gに梨地模様が形成されるようになっている。さてこの化粧板18は、航空機その他の内装材等として、例えば航空機のカート、ギャレー、コートクロゼットのパネル表面材やパネル外装材として使用されるが、図3はこのようなハニカムパネルPの1例を示す。すなわち、図3に示すようにハニカムパネルPは、ハニカムコアQの両面にパネル表面材X、Yが貼り付けられてなり、更に図示のように適宜、一方の表面側のパネル表面材X上にパネル外装材Zが貼り付けられる場合もあるが、化粧板18は、例えばこの一方のパネル表面材Xとして、又は、パネル表面材X上にパネル外装材Zが用いられる場合は、パネル外装材Zとして用いられる。

【0019】本発明の化粧板18は、以上のようになっている。そこで以下のようになる。この化粧板18では、まず表面の化粧紙Gとして、フィルム状をなし顔料19が練り込まれ混入されて着色されたフッ素系樹脂20が用いられ、又、芯材Hとしては、高密度な織り基材

21に対し、アクリル系樹脂22、フェノール系樹脂24、アクリル系樹脂22を順に組み合わせた各アブリレグ23、25、23が用いられている。そしてこの化粧板18は、このような化粧紙Gおよび3層の芯材Hを順に積層し、成形加工工程Wでコ・キュア加圧成形法を実施することにより、これらが一体的に成形されてなる。そして、芯材H中の図面上では最上層のアブリレグ23のアクリル系樹脂22により、化粧紙Gのフッ素系樹脂20とこの最上層のアブリレグ23とが接着され、又、芯材H中の最上層のアブリレグ23および最下層のアブリレグ23のアクリル系樹脂22により、この両アブリレグ23とその間のフェノール系樹脂24のアブリレグ25とが接着されている。なお、このような芯材Hの最下層のアブリレグ23が、従来の保護材C、F(図4、図5参照)に代わって、全体の保護的機能を果たしている。さてそこで、この化粧板18は、次の第1、第2、第3、第4、第5、第6、第7のようになる。

【0020】第1に、この化粧板18は、その化粧紙Gが顔料19入りフッ素系樹脂20よりなると共に、芯材H中にアクリル系樹脂22のアブリレグ23を用い、更に、フッ素系樹脂9、17の保護材C、F(図4、図5参照)を用いず、積層構造の数が4枚と非常に少ないので、厚みが0.35mmで1㎡当たりの重量が450g程度と、極めて肉厚が薄く特に重量が軽い。すなわち、図4のこの種従来例の化粧板1では、厚みが0.5mmで1㎡当たりの重量が900g程度もあり、又、図5の最近開発された従来例たる化粧板10でも、厚みが0.35mmで1㎡当たりの重量が500g程度あったのに対し、この化粧板18では、図5のものと比べても重量が10%程度軽くなっている。又この化粧板18は、このように積層構造の数が少ないと共に、更に、成形加工工程Wでコ・キュア加圧成形法を実施することにより成形され、成形時の工程数が大幅に削減されているので、成形が極めて簡単容易で特に安価に得られる。すなわち、図4のこの種従来例の化粧板1が、塗工工程R、グラビア加工工程S、ラミネート加工工程T、成形加工工程Uを辿って成形され、成形時の工程数が非常に多く、又、図5の化粧板10では、その芯材Eのアブリレグ15にアクリル系接着剤16をコートしたり、更に図4、図5の例共に、フッ素系樹脂9、17の保護材C、Fをセットし積層する工程に手間取っていたのに比べ、この化粧板18は、単にセットされ積層されたものにコ・キュア加圧成形法を実施するだけで得られ、安価に成形される。

【0021】第2に、この化粧板18は、このように積層構造の数が少なく、用いられる樹脂の種類が少ないと共に、成形時の工程数が削減されており移動が一段と少なく、特に、従来静電気が発生しやすかった保護材C、Fを用いないので、成形時に静電気は発生しない。従ってこの化粧板18は、静電気に起因する色むら、色抜け、しわ、凹凸、異物の付着・混入等の発生が確実に防

止され、図4のこの種従来例の化粧板1および図5の化粧板10に比し、外觀不良が確実に減少する。

【0022】これらと共に第3に、この化粧板18の芯材Hの織り基材21は高密度なものよりなり、柄が出にくく、更に、表面の化粧紙Gは顔料19が混入され補強されたフッ素系樹脂20よりなり、剛性、強度面に優れ厚いので、これらにより、成形加工工程Wのコ・キュア加圧成形法の実施時等において、芯材Hの織り基材21の縦糸と横糸の柄つまり生地肌が表面に出にくい。すなわち、図4のこの種従来例の化粧板1のように、化粧紙Aのフッ素系樹脂2が柔らかく25ミクロン程度と薄く、芯材Bの織り基材6の柄が表面に出やすかったのに比べ、この化粧板18にあっては、芯材Hの織り基材21が密で柄が出にくいのに加え、更に、強く50ミクロン程度と厚い化粧紙Gにより、芯材Hの織り基材21の柄が表面に出る外觀不良は、確実に防止される。

【0023】第4に、この化粧板18は、芯材Hの織り基材21が高密度なものよりなり、方向性が比較的少なくフラットとなりやすいので、全体的にもカールが発生しにくい。すなわち、図4のこの種従来例の化粧板1は、芯材Bとして2枚の所定のアブリレグ8を用い、剛性が高く強固なカールが発生しやすかったのに比べ、この化粧板18では、カールは発生しにくくなる。そこでこの化粧板18は、航空機その他の内装材等として、例えば製品のパネル表面材Xやパネル外装材Zとして貼り付けられる場合に(図3参照)、フラットな母材(ハニカムコアQ又はパネル表面材X)に対し、その外周部から剥がれ出すことはない。

【0024】第5に、この化粧板18の表面の化粧紙Gは、顔料19が練り込まれて着色されたフィルム状のフッ素系樹脂20よりなる。そこで、図4のこの種従来例の化粧板1のように、表面のフィルム状の透明なフッ素系樹脂2の下に、シート状の顔料4を配して着色された化粧紙Aに比し、この化粧板18の化粧紙Gは、フッ素系樹脂20が顔料19にて補強されている。従って、この化粧紙Gそして化粧板18は、長時間使用しても、摩耗しにくく耐摩耗性等に優れると共に、変色しにくく変色度評価が高く耐光堅牢度に優れている。

【0025】第6に、これらと共にこの化粧板18は、芯材Hにフェノール系樹脂24を用いたこと等により、火災に際し発熱量や発煙性等が低く、耐火性に極めて優れている。そこでこの化粧板18は、例えば航空機の内装材として使用される場合、発熱量測定試験や発煙性試験において、所定の厳しい耐火基準を満たすことができる。

【0026】第7に、更にこの化粧板18は、その芯材H中のアクリル系樹脂22のアブリレグ23により、化粧紙Gと芯材H間のみならず芯材H中のフェノール系樹脂24のアブリレグ25との間も、強力に接着され、芯材H間の接着性そして密着性にも優れている。すなわち



図5の最近開発された従来例の化粧板10のように、芯材Eの2枚間の接着力が弱く、その接着性に劣り密着性に若干問題があった事態は確実に回避される。

【0027】なお、図示例の化粧板18にあっては、その化粧紙Gの顔料19入り2フッ化フッ素系樹脂20として、無延伸タイプのフィルムが用いられている。そこで、図4のこの種従来例の化粧板1のように、その化粧紙Aの1フッ化フッ素系樹脂として、2軸延伸タイプのフィルムを用いてなるものに比し、この化粧板18の化粧紙Gは、延伸されて引っ張られていない分、成形加工工程Wでコ・キュア加圧成形法を実施した際に方向性が出にくい。従って、図示例の化粧紙Gそして化粧板18は、この点からも図4の従来例の化粧紙Aそして化粧板1に比し、しわ、凹凸、カール等の発生が防止されるという利点がある。

【0028】

【発明の効果】本発明に係る化粧板は、以上説明したように、化粧紙に顔料入りフッ素系樹脂を用いると共に、芯材として、高密度な織り基材にアクリル系樹脂、フェノール系樹脂、アクリル系樹脂を順に組み合わせた各ブリアレグを用いたことにより、次の第1、第2、第3、第4、第5、第6、第7の効果を発揮する。

【0029】第1に、肉厚面、重量面、コスト面に非常に優れている。すなわち、この化粧板は極めて肉厚が薄いと共に特に重量が軽く、軽量化等が重要課題である航空機その他の内装材等に最適であり、しかも、成形が極めて簡単容易で特に安価に得られる。

【0030】第2に、静電気による外観不良が確実に防止され、外観面に特に優れている。すなわち、この化粧板は成形時に静電気が発生しないので、静電気に起因する色むら、色抜け、しわ、凹凸、異物の付着・混入等、外観不良が防止され、不良率も非常に低い。特に、この化粧板は航空機その他の内装材等として、例えばカート、ギャレー、コートクロゼット等のパネル表面材やパネル外装材として、人の目にふれ美観が重視される箇所に使用されるので、このように外観面に特に優れることにより、製品外観を向上させる。

【0031】第3に、これらと共に、織り基材の柄が表面に出る外観不良も確実に防止され、この点からも外観面に特に優れている。すなわち、この化粧板は、芯材中に用いられる織り基材の縦糸と横糸の柄、つまり生地肌が生地肌が表面に出ず、外観面に特に優れているので、上述したところに準じ、人の目にふれる箇所に使用されて製品外観を向上させる。

【0032】第4に、カールによる剥がれがなく、品質面にも優れている。すなわち、この化粧板は、カールが発生しにくいので、航空機その他の内装材等として、例えばパネル表面材やパネル外装材として貼り付けられる場合に、フラットな母材に対しその外周部から剥がれ出すようなことがなく、品質面に非常に優れている。そこで貼り付けに際し、接着剤の使用管理が複雑化することがなく、又、熟練した取り扱いを要することもなく、工数が削減される。

【0033】第5に、耐摩耗性等の強度面や耐光堅牢度にも優れている。すなわち、この化粧板は長時間使用しても摩耗しにくい等、強度面に優れると共に、変色しにくく耐光堅牢度にも優れている。

【0034】第6に、耐火性に極めて優れている。すなわち、この化粧板は、発熱量や発煙性等が低く耐火性に極めて優れ、ハイレベルの耐火性が要求される航空機その他の内装材等に最適である。

【0035】第7に、密着性にも問題がない。すなわち、この化粧板にあっては、化粧紙と芯材間のみならず芯材自身間も強力に接着されており、芯材間の接着性に優れその密着性が向上するので、剥がれ等の発生は確実に防止される。このように、この種従来例に存した問題点が一掃される等、本発明の発揮する効果は顕著にして大なるものがある。

【図面の簡単な説明】

【図1】本発明に係る化粧板の実施例の成形説明図である。

【図2】コ・キュア加圧成形法による成形時の拡大説明図である。

【図3】ハニカムパネルの断面説明図である。

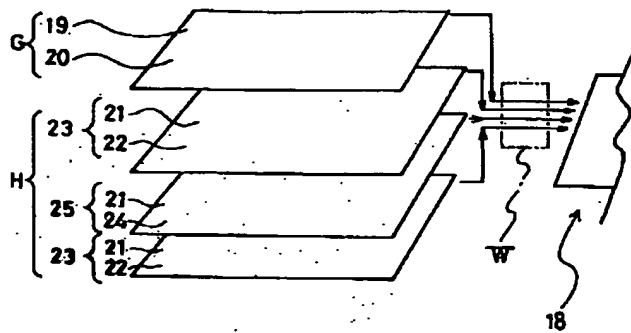
【図4】従来例の化粧板の成形説明図である。

【図5】最近開発された従来例の化粧板の成形説明図である。

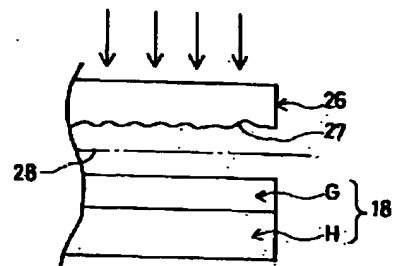
【符号の説明】

- 18 化粧板
- 19 顔料
- 20 フッ素系樹脂
- 21 織り基材
- 22 アクリル系樹脂
- 23 ブリアレグ
- 24 フェノール系樹脂
- G 化粧紙
- H 芯材
- W 成形加工工程

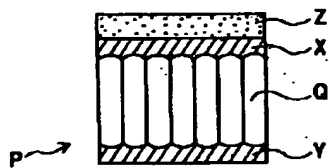
【図1】



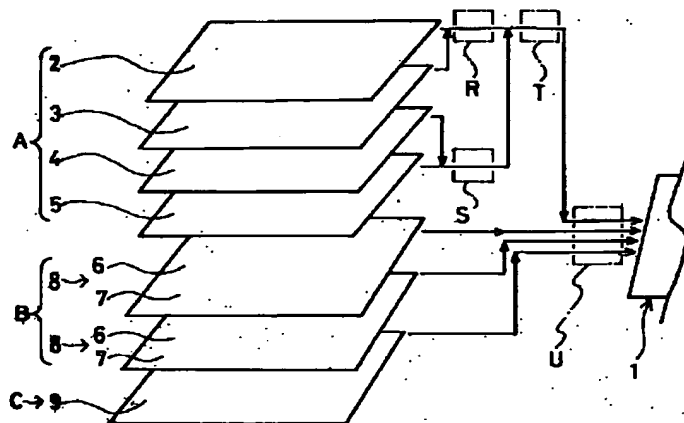
【図2】



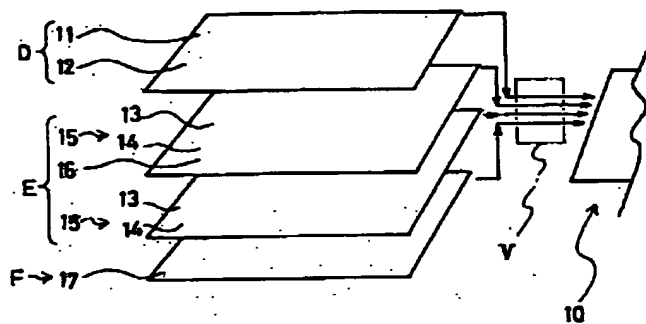
【図3】



【図4】



【図5】



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